

**DRAFT**

**Appendix G**  
**Site Inspection Checklist**

An annual site inspection of the Central Operable Unit (COU) was conducted on March 16, 2017 at the Rocky Flats site. This inspection consisted of a comprehensive walk-down of the entire COU looking for signs of erosion, subsidence, vegetation stress, debris, and any other environmental condition that could impact the remedy or associated engineered structures. The results of this annual inspection and site maps indicating the areas surveyed are provided following the FYR Site Inspection Checklist.

**Annual Site Inspection Team Roster**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Vera Moritz	RFLMA Project Coordinator	EPA Region 8
Carl Spreng	RFLMA Project Coordinator	CDPHE
Lindsay Masters	RFLMA Project Coordinator	CDPHE
Scott Surovchek	DOE-LM Site Manager	DOE-LM
Jeffrey Murl	DOE-LM Site Manager	DOE-LM

The Five-Year Review Site Inspection Checklist below was completed by reviewing site monitoring and inspection records for this FYR period and discussing checklist items with site staff.

## Five-Year Review Site Inspection Checklist Rocky Flats, Jefferson County, Colorado

I. SITE INFORMATION	
Site name: Rocky Flats, Central Operable Unit	Date of inspection: Various
Location and Region: Jefferson County, Colorado	EPA ID: CO7890010526
Agency, office, or company leading the five-year review: DOE-LM	Weather/temperature: Various
<b>Remedy Includes:</b> (Check all that apply) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment  <input checked="" type="checkbox"/> Other <u>monitoring (surface water, groundwater, site conditions) and groundwater collection and treatment</u> </div> <div style="width: 50%;"> <input type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input type="checkbox"/> Vertical barrier walls           </div> </div>	
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
<b>1. O&amp;M site manager</b> <u>SCOTT SUBOVCHER</u> <u>DOE-LM SITE MANAGER</u> <u>VARIOUS</u> <div style="display: flex; justify-content: space-between; margin-top: -10px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. <u>720-377-9682</u> Problems, suggestions; <input type="checkbox"/> Report attached _____ _____	
<b>2. O&amp;M staff</b> _____ <div style="display: flex; justify-content: space-between; margin-top: -10px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____	

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency EPA Region 8 RFLMA  
 Contact VECA MOUTE PROJECT COORDINATOR VARIOUS 303-312-6981  
 Name Title Date Phone no.  
 Problems; suggestions; ☐ Report attached

Agency CDPHE RFLMA  
 Contact CARL SPRENG PROJECT COORDINATOR VARIOUS 303-692-3358  
 Name Title Date Phone no.  
 Problems; suggestions; ☐ Report attached

Agency CDPHE RFLMA  
 Contact LINDSAY MASTERS PROJECT COORDINATOR VARIOUS 303-692-3310  
 Name Title Date Phone no.  
 Problems; suggestions; ☐ Report attached

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions; ☐ Report attached

4. **Other interviews (optional)** ☐ Report attached.

DOE-LM contractor involved in site monitoring and inspection also provided input for the FYR site inspection.

\* Interaction with RFLMA PROJECT COORDINATORS regarding site conditions is not limited to the annual site inspections, but is continuous through the RFLMA cancellation process.



III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply) *				
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input checked="" type="checkbox"/> As-built drawings <input checked="" type="checkbox"/> Maintenance logs Remarks <i>Some O&amp;M manuals and as-built drawings are being updated as a result of system modifications.</i>	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input checked="" type="checkbox"/> Contingency plan/emergency response plan Remarks <i>Site is governed by DOE-LM-wide safety and health manual and emergency response plan.</i>	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input checked="" type="checkbox"/> Other permits <i>USFWS</i> Remarks <i>Effluent discharge is monitored thru RFMA (federal facilities agreement)</i>	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks <i>Surface water monitoring records are also readily available and up-to-date.</i>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input checked="" type="checkbox"/> Water (effluent) Remarks <i>Effluent discharge monitored at con boundary PCs.</i>	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

\* Documents discussed in this section are generally kept in LMS contractor office, not on-site, unless they are required to be available on-site.

IV. O&M COSTS																																											
1.	<b>O&amp;M Organization</b> <input type="checkbox"/> State in-house <input type="checkbox"/> Contractor for State <input type="checkbox"/> PRP in-house <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Contractor for Federal Facility <input type="checkbox"/> Other _____																																										
2.	<b>O&amp;M Cost Records</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ <input type="checkbox"/> Breakdown attached  <div style="text-align: center;">Total annual cost by year for review period if available</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">From _____</td> <td style="width: 15%;">To _____</td> <td style="width: 40%;"></td> <td style="width: 30%; text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> </table>			From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost	
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3.	<b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b> Describe costs and reasons: _____ _____ _____ _____ _____																																										
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A																																											
<b>A. Fencing</b>																																											
1.	<b>Fencing damaged</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Gates secured <input checked="" type="checkbox"/> N/A Remarks _____ _____																																										
<b>B. Other Access Restrictions</b>																																											
1.	<b>Signs and other security measures</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks <u>In good condition and inspected quarterly.</u> _____																																										

\* See Section 6.1.5 for discussion of O&M costs in this fourth FYR report.

<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and enforcement</b> Site conditions imply ICs not properly implemented <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A</span> Site conditions imply ICs not being fully enforced <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A</span>		
	Type of monitoring (e.g., self-reporting, drive by) <u>On-Site visits</u> Frequency <u>Most work days</u> Responsible party/agency <u>DOE-LM</u> Contact <u>Scott Szwed/STK</u> <u>DOE-LM SITE MGR</u> <u>N/A</u> <u>720-377-9682</u> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Name</span> <span>Title</span> <span>Date</span> <span>Phone no.</span> </div>		
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
2.	<b>Adequacy</b> <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A Remarks <u>ICs are enforceable by the state of CO via Environmental Use Restrictions filed with the local county.</u>		
<b>D. General</b>			
1.	<b>Vandalism/trespassing</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident Remarks _____		
2.	<b>Land use changes on site</b> <input checked="" type="checkbox"/> N/A Remarks _____		
3.	<b>Land use changes off site</b> <input checked="" type="checkbox"/> N/A Remarks _____		
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Roads damaged</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A Remarks _____		

<b>B. Other Site Conditions</b>			
Remarks _____ <i>Overall site vegetation cover is good.</i> _____ _____ _____			
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A <i>OLF &amp; PLF</i> <i>✓</i>			
<b>A. Landfill Surface</b>			
1.	<b>Settlement</b> (Low spots) Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Settlement not evident
<i>Inspections are performed periodically per the Landfill M&amp;M Plan. See corresponding inspection checklists and reports in site records and annual site reports.</i>			
2.	<b>Cracks</b> Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident
<i>See remarks in VII A.1.</i>			
3.	<b>Erosion</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Erosion not evident
<i>See remarks in VII A.1.</i>			
4.	<b>Holes</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> Holes not evident
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress	
<i>Vegetation covers meet success criteria except in areas that have recently been disturbed.</i>			
6.	<b>Alternative Cover</b> (armored rock, concrete, etc.) Remarks _____	<input checked="" type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input type="checkbox"/> Bulges not evident
<i>See remarks in VII A.1.</i>			

*\* The March 2017 OLF inspection report and the First Quarter (March 2017) PLF inspection report are attached.*

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks <u>See remarks in VII A.1.</u>	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides Areal extent _____ Remarks <u>See remarks in VII A.1.</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	<b>Flows Bypass Bench</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
2.	<b>Bench Breached</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
3.	<b>Bench Overtopped</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
<b>C. Letdown Channels</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A <u>at OLF</u> (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	<b>Settlement</b> Areal extent _____ Depth _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement
2.	<b>Material Degradation</b> Material type _____ Areal extent _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion

4.	<b>Undercutting</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of undercutting Areal extent _____ Depth _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>
5.	<b>Obstructions</b> Type _____ <input type="checkbox"/> No obstructions <input type="checkbox"/> Location shown on site map    Areal extent _____ Size _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>
6.	<b>Excessive Vegetative Growth</b> Type _____ <input type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map    Areal extent _____ Remarks <u>See remarks in VII A.1 and attached OLF inspection report.</u>
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Gas Vents</b> <input type="checkbox"/> Active <input checked="" type="checkbox"/> Passive <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____
2.	<b>Gas Monitoring Probes</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
3.	<b>Monitoring Wells (within surface area of landfill)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
4.	<b>Leachate Extraction Wells</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
5.	<b>Settlement Monuments</b> <input checked="" type="checkbox"/> Located <input checked="" type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A Remarks _____

<b>E. Gas Collection and Treatment</b>		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b>		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b>		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1.	<b>Siltation</b> Areal extent _____ Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>II. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement_____	Vertical displacement_____	
	Rotational displacement_____		
	Remarks_____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks_____		
<b>1. Perimeter Ditches/Off-Site-Discharge</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent_____	Depth_____	
	Remarks_____	See Remarks in VII A.1.	
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent_____	Type_____	
	Remarks_____	See Remarks in VII A.1.	
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent_____	Depth_____	
	Remarks_____	See Remarks in VII A.1.	
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
	Remarks_____		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent_____	Depth_____	
	Remarks_____		
2.	<b>Performance Monitoring</b>	Type of monitoring_____	
	<input type="checkbox"/> Performance not monitored		
	Frequency_____	<input type="checkbox"/> Evidence of breaching	
	Head differential_____		
	Remarks_____		



<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

C. Treatment System		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply) <input checked="" type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input checked="" type="checkbox"/> Bioremediation <input checked="" type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters <input checked="" type="checkbox"/> Additive (e.g., chelation agent, flocculent) <u>Carbon nutrient source</u> <input type="checkbox"/> Others _____ <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> Sampling ports properly marked and functional <input checked="" type="checkbox"/> Sampling/maintenance log displayed and up to date <input checked="" type="checkbox"/> Equipment properly identified <input checked="" type="checkbox"/> Quantity of groundwater treated annually <u>3.3 MILLION GALLON</u> (average annual volume treated from 2012-2016) <input type="checkbox"/> Quantity of surface water treated annually <u>N/A</u> Remarks <u>Maximum treatability studies are ongoing. in 4 systems</u>		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input checked="" type="checkbox"/> Chemicals and equipment properly stored Remarks _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____		
<b>D. Monitoring Data</b>			
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining		

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells (natural attenuation remedy)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).  <i>See Section 6.1 of this fourth FYR report.</i>			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.  <i>See Section 6.1.5 of this fourth FYR report.</i>			

<b>C.</b>	<b>Early Indicators of Potential Remedy Problems</b>
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.	
<i>See Section 6.1.5 of this fourth FYR report.</i>	
<b>D.</b>	<b>Opportunities for Optimization</b>
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.	
<i>See Section 6.1.4.3 of this fourth FYR report.</i>	

## Present Landfill– Monitoring and Maintenance Plan Inspection Form

Inspector: Patrick Boulas Date: 3/13/17 Time: 13:30 Reviewed by: Jeremy Wehner

Temperature: 50 deg F Weather conditions: Partly Cloudy Review date: 3/27/17

Meteorological station location: Rocky Flats Meteorological Station

Subsidence/Consolidation					
Region	Evidence of cracks	Evidence of depressions	Evidence of sinkholes	Evidence of ponding	Other (Describe below)
Top cover– West	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Top cover– East	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cover side slope– North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cover side slope– South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– Central	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– North Seep*	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Settlement plates and side slope monitoring points to be inspected for integrity. During year 1, they will be surveyed quarterly, and annually thereafter.			Integrity intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

\*Area of seep is outside of landfill cover and east of the cover anchor trench.

Maintenance required, comments, photo log: No maintenance necessary.

**Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)**

Slope Stability				
Region	Evidence of cracks	Evidence of block or circular failure	Evidence of seeps	Other (Describe below)
Cover side slope– North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cover side slope– South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Perimeter channel outer slope– North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Perimeter channel outer slope– South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope– South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope–Central	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East face slope–North seep*	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

\*Area of seep is outside of landfill cover and east of the cover anchor trench

<p>Maintenance required, comments, photo log: The soil was damp but no flow was visible in the east face slope - north seep.</p>
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## Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)

Soil Cover							
Region	Evidence of deposition or erosion		Evidence of erosion rills or gullies		Evidence of burrowing animals	Other (Describe below)	
Top of cover–West	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Top of cover–East	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Cover side slope–North	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Cover side slope–South	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
East face slope–North	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
East face slope–South	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
East face slope–Central	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Area where east slope central meets east slope–North	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Area where east slope central meets east slope–South	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
	<b>Vent caps in place and secure</b>		<b>Standpipes in good condition</b>		<b>Birds or insects in vent caps</b>		
Cover–barometric vents	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	

Maintenance required, comments, photo log: No maintenance necessary.

## Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)

Seep Treatment System			
Region	Evidence of plugging, obstructions, or excess debris	Evidence of cracks or deterioration	Other (describe below)
GWIS inlet pipes	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Strip drain inlet pipe	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
North manhole outlet pipe	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
South manhole outlet pipe	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Treatment unit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Treatment unit outlet pipe	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
North manhole	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
South manhole	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Treatment unit grating	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Maintenance required, comments, photo log: No maintenance necessary. The new grout at the north and south manholes is in good condition.



## Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)

Stormwater Management Structures							
Structure	Evidence of excessive erosion, gullyng, scour, or undermining	Evidence of settlement subsidence or depressions	Evidence of breaching or bank failure	Evidence of burrowing animals	Evidence of sediment build-up or other blockage	Evidence of lining deterioration holes, rips, or separations	Evidence of lining displacement
Diversion berm	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Vegetation lines perimeter channel–North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Vegetation lined perimeter channel–South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Riprap lined perimeter channel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C350 lined east face	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
East face riprap channel–North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
East face riprap channel–South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Other deficiencies: N/A

Maintenance required, comments, photo log: No maintenance necessary.

Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)

Stormwater Management Structures (continued)

OUTFALLS

Check each structure for excessive erosion and sediment depth. If sediment depth is compromising the design characteristics, remove sediment.

Structure	Condition and sediment depth
Diversion Berm Outfall–North	No issue
Diversion Berm Outfall–South	No issue
Culvert 1 outfall	No issue
Culvert 2 outfall	No issue
South culvert outfall	No issue

CULVERTS

Check each structure for blockage, surrounding conditions, breaching, sediment build-up, and inlet/outlet conditions.

Structure	Condition
Culvert 1	No issue
Culvert 2	No issue
South Culvert	No issue

Maintenance required, comments, photo log: No maintenance necessary.

**Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)**

"Run-On" Erosion Control		
Area	Adversely affecting PLF	
Run-on into perimeter channel–North	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
Run-on into perimeter channel–South	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
Natural drainage fed by culvert 1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
Natural drainage fed by northeast perimeter channel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
Natural drainage fed by riprap	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:

Maintenance required, comments, photo log: No maintenance necessary.

**Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)**

**Institutional Controls**

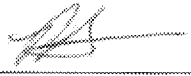
Item	
Evidence of excavation(s) of cover and immediate vicinity of cover?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:
Evidence of construction of roads, trails, on cover or buildings?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:
Evidence of unauthorized entry?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:
Evidence of drilling, wells or use of groundwater?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:
Disruption or damage of seep treatment system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:
Damage or removal of any signage or groundwater monitoring wells?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Comment:

Other deficiencies, photo log: N/A

Contractor to U.S. Department of Energy Office of Legacy Management

Present Landfill – Monitoring and Maintenance Plan Inspection Form (continued)

Action Items				
Deficiency	Date noted	Action	Date completed	Comments
No Deficiencies	3/13/2017			

Inspector signature: 

Date: 3/14/17

Reviewer signature: 

Date: 3/27/2017















Attachment 1: March 2017  
Monthly Report of the Original Landfill Inspection at the Rocky Flats Site

The monthly inspection of the Original Landfill (OLF) at the Rocky Flats Site, Colorado, was completed on March 22, 2017. The weather was sunny and clear during the inspection. The Rocky Flats Site Meteorological Tower recorded 0.08 inches of precipitation at the site between this inspection and the prior inspection of February 22, 2017. The National Renewable Energy Laboratory M2 tower, adjacent to the northwest corner of the site, recorded 0.30 inches during the same time period using a heated rain gauge.

Figure 1 provides the approximate locations where each of the inspection photographs were taken on the OLF (as shown in Figures 2–7).

No new signs of movement were observed on the OLF (Figure 2). No new cracks since the time of the previous inspection have been observed. Regions that show cracks that were backfilled are no longer checkmarked on the inspection form. Items that are checkmarked are from previous cracks that cannot be backfilled with hand tools. A description is included with information about the checkmarked items. The most notable cracks in 2016, southeast of Berm 5 starting just below Seep 2/3, were repaired during the September 2016 minor regrading (Figure 3), and since then, no signs of cracking or movement have been observed.

The construction of the OLF temporary groundwater intercept system started on March 14, 2017. At the time of inspection, the gravity drain line was in place and connected to the East Subsurface Drain (ESSD) (Figure 4). During the inspection, a subcontractor was flushing water through the ESSD lines and repairing the erosion control mat near the ESSD that had blown away. Weekly inspection of the ESSD and ESSD outfall has not resulted in the discovery of any visible water flowing out of the pipes; however, the ESSD outfall was damp. Erosion-control is in good condition, and most of the minor damage occurring from wildlife and high winds has been repaired (Figure 5). Staking the drainage pipe at more frequent intervals has reduced movement caused by high winds and is expected to increase the life of the drainage pipe. The revegetation of recently disturbed areas on the OLF is managed and monitored under the *Erosion Control Plan for Rocky Flats Property Central Operable Unit* (DOE 2007)<sup>1</sup> and under the sitewide vegetation and revegetation plans.

Seep 8A had the highest flow of the seeps at approximately 2 gallons per minute (gpm). Seep 2/3 was flowing less than 1 gpm and Seep 7 was damp. Seep 9 and Seep 4 had pockets of water with no visible flow. A wet area was discovered, about 30 feet north of the Seep 2/3 drainage outfall, flowing at approximately 1 gpm (Figure 6). The wet area appears to be from water in the East Perimeter Channel (EPC) that percolates through the EPC side slope instead of

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<sup>1</sup> DOE (U.S. Department of Energy), 2007. *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, DOE-LM/1497-2007, Office of Legacy Management, Rocky Flats Environmental Technology Site, July.

towards the EPC outfall. This water then continues to run south along the Seep 2/3 drainage pipe, creating pockets of water and damp soil running to Woman Creek (Figure 7). The Seep 2/3 drainage pipe was moved so that the drainage outfall would discharge in the EPC, in an effort to reduce the amount of water at the wet area. The wet area will be monitored to determine the effects of moving the Seep 2/3 drainage pipe, and to observe whether it is being fed by surface or subsurface sources. No ground movement has been observed in this area since the previous inspection. The rest of the historic seep locations on the OLF were dry at the time of inspection.

### Summary

No new ground movement of the OLF cover was observed during the inspection. Minor corrugated drainage pipe damage behind Berm 7 was repaired. A wet area was discovered that appears to shortcut the EPC outfall to Woman Creek. The inspection forms are filled out to represent current conditions at the OLF. Repaired items will no longer be checkmarked as evidence unless further action is warranted.

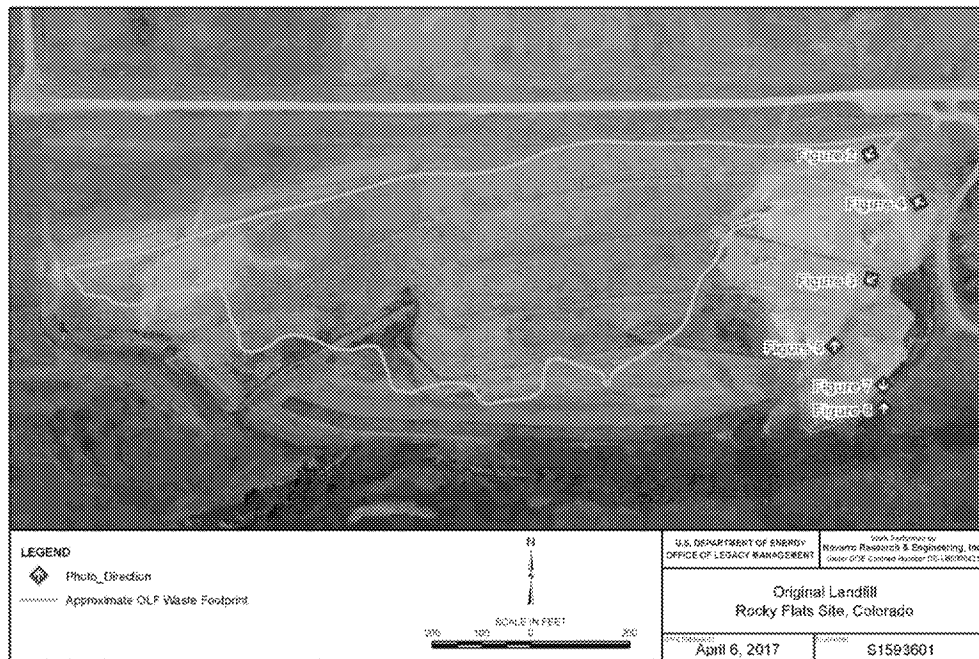


Figure 1. Location and Direction of Each of the Photographs Referred to in this Report (Figures 2–7), Rocky Flats Site OLF



Figure 2. Looking South at Berm 4 and the New Above-Ground Drain Pipe Running from the OLF Groundwater Intercept System to the ESSD



Figure 3. Looking West, Just East of Berm 6

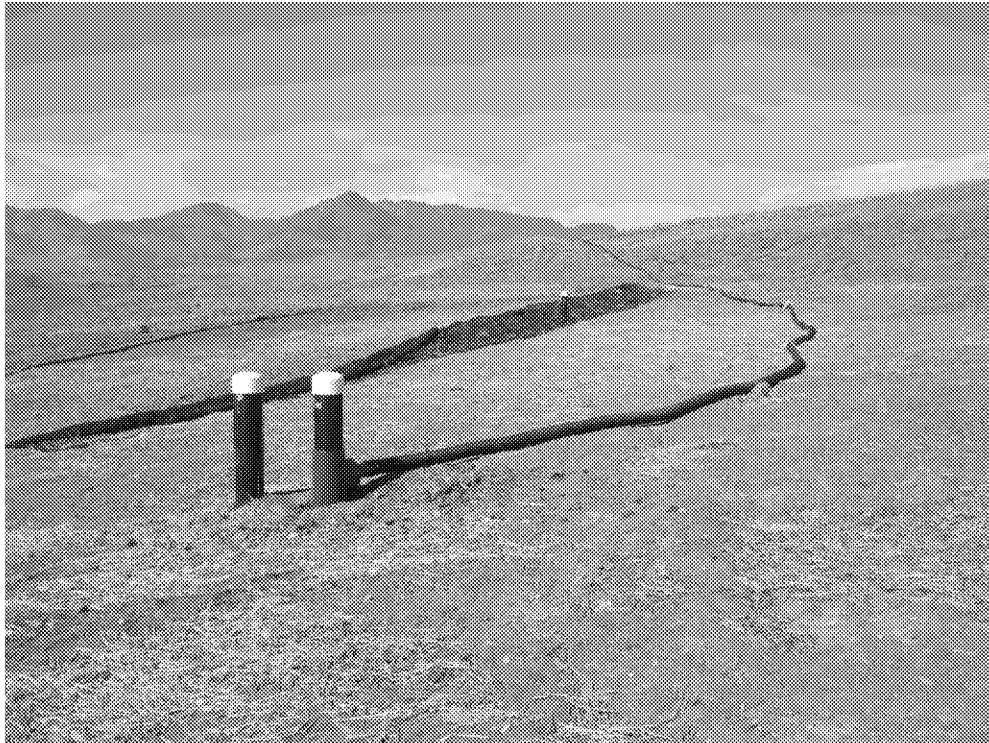


Figure 4. Looking West, at Berm 4 and the Gravity Drain Line Connection to the ESSD



Figure 5. Standing on Berm 7 Looking North to Berm 6



Figure 6. Standing Below the Seep 2/3 Drainage Outfall Looking North at the Wet Area Discovered (estimated outline in blue)

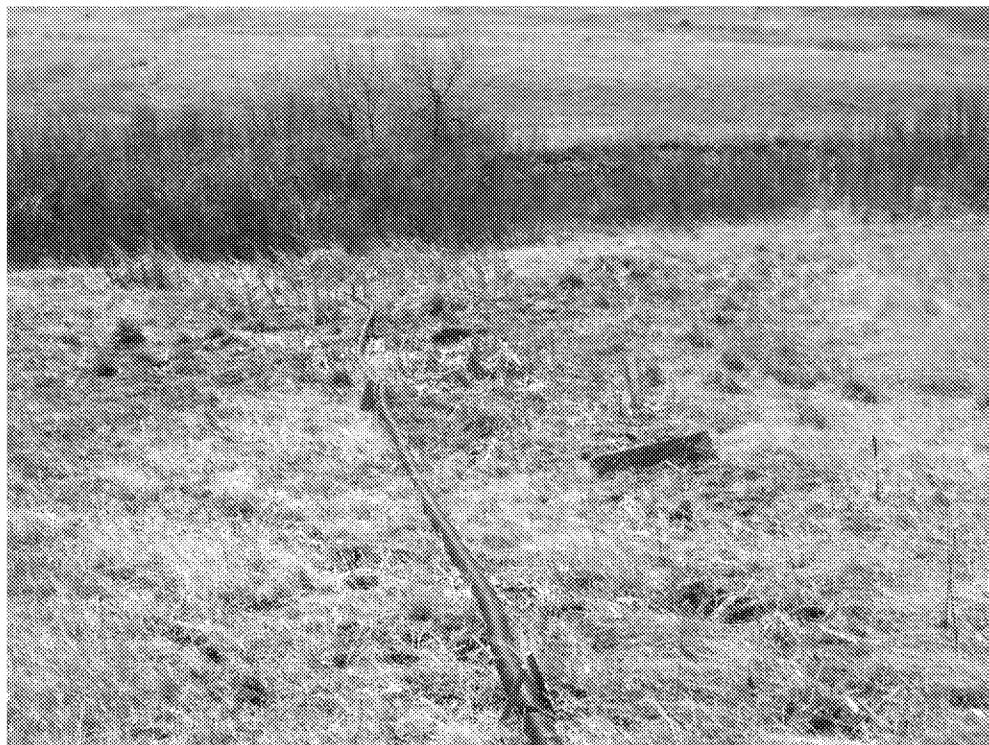


Figure 7. Standing Above the Seep 2/3 Drainage Outfall Looking South at the Wet Area Discovered

## Original Landfill – Monitoring and Maintenance Plan Inspection Form

Inspector: Patrick Boulas Date: 3/22/17 Time: 11:30 AM Reviewed by: Jeremy Wehner  
 Temperature: 56 DEG F Weather conditions: Sunny Review date: 4/3/2017

Subsidence/Consolidation					
Region	Evidence of cracks	Evidence of depressions	Evidence of sink holes	Evidence of ponding	Other (Describe below)
Top cover–West	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Top cover– East	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buttress fill	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Diversion Berm 1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Diversion Berm 2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Diversion Berm 3	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Diversion Berm 4	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Salt stain
Diversion Berm 5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Salt stain
Diversion Berm 6	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Diversion Berm 7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Settlement plates—inspection integrity. Intact ☒ Yes ☐ No

Maintenance required, comments, and/or photo log: No new movement observed at the Original Landfill (OLF). The Rocky Flats Site Meteorological Tower recorded 0.08 inches of precipitation since the last monthly report. The National Renewable Energy Laboratory M2 tower, adjacent to the northwest corner of the site, recorded 0.30 inches during the same time period using a heated rain gauge. No new cracks were observed.

## Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Slope Stability				
Region	Evidence of cracks	Evidence of seeps	Evidence of block or circular failure	Other (Describe below)
Cover– West	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cover– East	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buttress fill side slope	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
West perimeter channel side slopes	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
East perimeter channel side slopes	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Wet area found near Seep 2/3 drainage outfall
Cover seeps (if present)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Maintenance required, comments, and/or photo log: East Perimeter Channel (EPC) had no visible flow, but mud and pockets of water were present throughout the channel. Seep 8A had the highest flow of the seeps at approximately 2 gallons per minute (gpm). Seep 2/3 was flowing at less than 1 gpm and Seep 7 was damp. Seep 9 and Seep 4 had pockets of water but no visible flow. A wet area was discovered about 30 feet north of the Seep 2/3 drainage outfall. The source of the wet area is not clear at this time. The wet area is running south along the Seep 2/3 drainage pipe and has pockets of water and damp soil leading to Woman Creek. No ground movement has been observed in this area since the discovery of the wet area. The Seep 2/3 drainage pipe was moved to the EPC and the wet area will be monitored to determine if it is being fed by surface or subsurface sources, and any effects will be recorded.

Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Soil Cover				
Region	Evidence of deposition or erosion	Evidence of erosion rills or gullies	Evidence of burrowing animals	Other (Describe below)
Cover– West	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cover– East	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buttress fill	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buttress fill side slope	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Maintenance required, comments, and/or photo log: N/A



## Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Vegetation				
Region	Condition of grass	Unwanted vegetation present*	Percentage of grass versus bare ground	Percentage of unwanted vegetation
Cover– West	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Cover– East	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 1	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 2	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 3	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 4	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 5	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 6	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Diversion Berm 7	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
West perimeter channel	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
East perimeter channel	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Upper buttress fill side slope	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Lower buttress fill side slope	See Comments	<input type="checkbox"/> Yes <input type="checkbox"/> No		

\*Unwanted vegetation includes weeds and "woody vegetation." Woody vegetation within the original landfill (OLF) waste footprint must be removed. Other locations must be evaluated per section 3.5 of the Original Landfill Monitoring and Maintenance Plan.

Maintenance required, comments, and/or photo log: Vegetation inspection is no longer required by Rocky Flats Legacy Management Agreement. New areas of disturbance are addressed under the site wide revegetation plan, "Erosion Control Plan for Rocky Flats Property Central Operable Unit."

## Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Stormwater Management Structures										
Channels										
Structure	Evidence of excessive erosion, gully, scour, or undermining		Evidence of settlement, subsidence, or depressions		Evidence of breaching or bank failure		Evidence of burrowing animals		Evidence of sediment build-up or other blockage	
Diversion Berm 1	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 2	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 3	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 4	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 5	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 6	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Diversion Berm 7	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Temporary check dams*	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
West perimeter channel	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
East perimeter channel	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

\*Check dams may be removed after vegetation is established.

Other deficiencies: None

Maintenance required, comments, and/or photo log: The damaged corrugated drainage pipe behind Berm 7 was repaired.

Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Stormwater Management Structures (continued)

Outfalls

Check each structure for excessive erosion and sediment depth. If sediment depth is compromising the design characteristics, remove sediment.

Structure	Condition and sediment depth
Diversion Berm Outfall 1	No issues
Diversion Berm Outfall 2	No issues
Diversion Berm Outfall 3	No issues
Diversion Berm Outfall 4	No issues
Diversion Berm Outfall 5	No issues
Diversion Berm Outfall 6	No issues
Diversion Berm Outfall 7	No issues
West perimeter channel outfall	No issues, dry, no flow
East perimeter channel outfall	Muddy with pockets of water, no visible flow
French drain outfall (SID)	Dry, no flow

Other deficiencies: None

Maintenance required, comments, and/or photo log: No new erosion or sediment buildup. There were mud and pockets of water at the EPC outfall. The East Subsurface Drain (ESSD) outfall had no flow but the ESSD outfall channel was damp in the weekly inspections leading up to the monthly inspection. At the time of the monthly inspection, the ESSD lines were being flushed with water per the subcontractor's punch list and water was observed at the outfall.

Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

"Run-On" Control		
Area	Adversely affecting OLF	
North of the original landfill	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
West of the west perimeter channel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
East of the east perimeter channel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:
North of Woman Creek	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comment:

Maintenance required: N/A

Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Institutional Controls	
Item	
Evidence of excavation(s) of cover and immediate vicinity of cover?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Comment:
Evidence of construction of roads, trails, or buildings on cover?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Comment:
Evidence of drilling of wells or use of groundwater?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Comment:
Damage or removal of any signage or groundwater monitoring wells?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Comment:
<p>Other deficiencies and/or photo log: The 2017 OLF Temporary Groundwater Intercept System described in CR 2017-01 has two wells that have been drilled just upgradient of the OLF cover and outside the OLF boundary.</p>	

## Original Landfill – Monitoring And Maintenance Plan Inspection Form (continued)

Action Items				
Deficiency	Date noted	Action	Date completed	Comments
Drainage pipe behind Berm 7 was damaged	3/22/17	Drainage pipe was repaired with new coupler and taped	3/22/17	
Erosion-control mat disturbed south of berm 7	3/22/17	Restaked erosion control mat, ecologist was notified	3/22/17	

Inspector signature: \_\_\_\_\_

Date: 4/12/2017

Reviewer signature: \_\_\_\_\_

Date: 4/12/2017